# APPENDIX 5.22
# Data Quality Analysis

## Appendix 5.22 Data Quality Analysis

1. A comparison of the workplan data collection goals with the actual numbers and types of samples collected was completed in order to verify the completion of the proposed analytical program. This comparison is tabulated in Tables 5.22.1A to 5.22.1G. These tables indicate that the proposed analytical program in the approved workplan was either met or exceeded. Exceedances were possible due to the addition of soil borings to the field activities.

2. Because the preparation of a Quality Assurance Plan was not in the scope of work subsequent to the approval of the workplan, a formal list of Data Quality Objectives was not prepared for every potential chemical that may have been detected prior to design of the analytical protocols. Please also note that the two more stringent ARARs (Public Health Goals (PHGs) and Primary Remediation Goals (PRGs) for drinking water) used in the comparative analysis, and arguably the least applicable to the current and future Site use, were included as applicable ARARs (for comparative purposes) subsequent to the workplan approval.

The detection limits for the detected analytes in soil (surface and subsurface), sediment, and groundwater were compared to the media-specific ARARs used for comparative analysis in Tables 4.12 to 4.24 to assess the quality of the data and validity of the analytical methods utilized in the assessment. If a laboratory's detection limit exceeds an ARAR-specific concentration then the validity of a prescribed laboratory analysis methodology should be evaluated. This comparison is tabulated in Table 5.22.2. After review of this table it appears that the reported laboratory detection limits for detected analytes in soil and sediment samples did not exceed the CHHSL for commercial/industrial land use. Six of the reported laboratory detection limits for analytes detected in groundwater samples did exceed at least one of the three ARARs used for the comparative analysis (benzene, 1,4-Dichlorobenzene, bis(2-ethylhexyl) phthalate, pentachlorophenol, hexavalent chromium, and arsenic). Two of these exceed the Ocean Plan criteria (bis(2-ethylhexyl) phthalate and hexavalent chromium). A lower detection limit for benzene and 1,4-Dichlorobenzene could possibly have been achieved if drinking water standards (EPA Methods 502.2 or 524.2) were employed in the laboratory analysis protocol. However, please note that lower laboratory detection limits produced from the use of drinking water standard methodology are sensitive to matrix effects (which were observed to be inherent in samples collected from the Site) which affect quantitation limits. It is not apparent what laboratory methods could have been employed to produce lower detection limits for the semivolatile organic compounds (bis(2-ethylhexyl) phthalate and pentachlorophenol); possibly a drinking water standard laboratory methodology that applies specifically to SVOCs.

Five groundwater samples collected from soil borings were reported with detection limits for hexavalent chromium at 5 µg/L. The remainder of groundwater samples was reported with detection limits for hexavalent chromium at 1 µg/L. The higher detection limit for five of the groundwater samples was reportedly caused by matrix effects that effectively increased the practical quantitation limit or detection limit to 5 µg/L. The only inorganic

chemical that was reported with a detection limit above the most stringent ARAR (0.0040 µg/L) used in the comparative analysis is arsenic. This is unavoidable due to the fact that no current laboratory method can achieve detection limits that are lower than this guidance concentration.

3. A review of the laboratory data qualifiers for all data collected was completed as a means of validating the quality of the data. The review focused on aspects of the laboratory analysis such as laboratory QA/QC procedures and reporting, sample holding times, and analytical results of field QA/QC samples, and is tabulated in Table 5.22.3. This table lists the specific laboratory job numbers with corresponding QA/QC data quality comments. The two types of comments noted in the analyses performed by American Scientific Laboratories (ASL) are related to matrix effects and how they have affected surrogate recovery and practical quantitation limits. In order for the laboratory to verify the validity of their findings they perform QA/QC procedures such as matrix spikes. Matrix spikes are performed by passing chemicals of known identity and concentration (surrogates) through a sample matrix and quantifying the recovery of the surrogates. If one or multiple surrogates are not recovered in quantities within a specified range it suggests that either something in the sample matrix or the laboratory equipment is causing the insufficient surrogate recovery. In order to assign the cause of the insufficient surrogate recovery to one of these two potential causes the laboratory will perform a laboratory control sample where surrogates are passed through the equipment without a sample matrix. If one or multiple surrogates are not recovered in quantities within a specified range it suggests that the laboratory equipment may be causing the insufficient surrogate recovery.

Three of the ASL laboratory data qualifier comments are that practical quantitation limits were higher due to matrix effects. This means that detection limits were raised due to the presence, usually high concentrations, of another analyte. The detection limit is raised due to sample dilutions required to address the presence of the other analyte.

Table 5.22.3 indicates that laboratory control samples were analyzed in all instances where surrogate recovery or practical quantitation limits were reportedly affected by matrix effects. All but two laboratory reports with laboratory control sample analysis indicate that the laboratories comment that surrogate recovery or practical quantitation limits were affected by matrix effects are valid. The other two have laboratory control sample surrogate(s) recovery percentages that are slightly below the specified ranges which may indicate that surrogate recovery may not only be affected by matrix effects but by laboratory equipment or a combination of the two.

It was also noted in the laboratory report from Battelle Laboratories that the blank metal concentration for Thallium was greater than 10 times the method detection limit (MDL). All groundwater and drive point sample results were less than 5 times the blank concentration which indicates that the results may be impacted. The observed contamination is registering in the method blank possibly due to laboratory contamination.

The review of laboratory data qualifiers and other QA/QC related aspects of the collected laboratory data suggest that the laboratory data is valid and reliable for the environmental investigation.

4. Field QA/QC procedures in the form of blank and duplicate samples were collected during the completion of groundwater sampling activities. A field blank (FB) and trip blank (TB) were reported to contain zinc concentrations above the associated detection limit. The reported zinc concentration in the field blank (4.28 µg/L) is considerably higher than the reported zinc concentration in the trip blank (0.110 µg/L) which suggests field contamination.

**Table 5.22.1A**
**Soil Boring Soil Sample Analytical Objective Analysis**
**Mission Bay Landfill**
**San Diego, California**

| Analytes | Proposed Analysis | Completed Analysis | Met or Exceeded Analysis Objective |
|---|---|---|---|
| VOCs | 0 | 0 | NA |
| Semi-volatile organic compounds (SVOCs) | 20 | 23 | **Exceeded by 3** |
| Polychlorinated biphenyls (PCBs) | 0 | 0 | NA |
| Pesticides | 0 | 0 | NA |
| Chlorinated Herbicides | 0 | 0 | NA |
| Polynuclear aromatic hydrocarbons (PAHs) | 0 | 0 | NA |
| Title 22 Metals | 20 | 23 | **Exceeded by 3** |
| Ultra-low detection sampling and analysis for 17 metals | 0 | 0 | NA |
| Cyanide | 0 | 0 | NA |
| Fluoride | 0 | 0 | NA |
| pH | 0 | 0 | NA |
| Alkalinity | 0 | 0 | NA |
| Chloride | 0 | 0 | NA |
| Specific Conductance | 0 | 0 | NA |
| Total Dissolved Solids | 0 | 0 | NA |
| Hardness | 0 | 0 | NA |
| Nitrate | 0 | 0 | NA |
| Sulfate | 0 | 0 | NA |
| Non-methane organic compounds (NMOC) | 0 | 0 | NA |
| Biogenic/fixed gases: Oxygen, carbon dioxide, methane, carbon monoxide, nitrogen | 0 | 0 | NA |
| Sulfur gases: Hydrogen sulfide, carbonyl sulfide, carbon disulfide, mercaptans | 0 | 0 | NA |
| Total organic compounds (TOC) | 0 | 0 | NA |

**Notes:**
Analysis performed for soil samples collected from soil borings converted to monitoring wells.
NA = Not applicable

**Table 5.22.1B**
**Direct Push Soil Boring Soil & Groundwater Sample Analytical Objective Analysis**
**Mission Bay Landfill**
**San Diego, California**

| Analytes | Proposed Analysis (soil/groundwater) | Completed Analysis (soil/groundwater) | Met or Exceeded Analysis Objective (soil/groundwater) |
|---|---|---|---|
| VOCs | 0/10 | 0/10 | NA/**Met** |
| Semi-volatile organic compounds (SVOCs) | 20/10 | 24/13 | **Exceeded by 4/Exceeded by 3** |
| Polychlorinated biphenyls (PCBs) | 0/0 | 0/0 | NA |
| Pesticides | 0/0 | 0/0 | NA |
| Chlorinated Herbicides | 0/0 | 0/0 | NA |
| Polynuclear aromatic hydrocarbons (PAHs) | 0/0 | 0/0 | NA |
| Title 22 Metals | 20/0 | 24/0 | **Exceeded by 4/Met** |
| Ultra-low detection sampling and analysis for 17 metals | 0/0 | 0/0 | NA |
| Cyanide | 0/0 | 0/0 | NA |
| Fluoride | 0/10 | 0/13 | NA/**Exceeded by 3** |
| pH | 0/10 | 0/13 | NA/**Exceeded by 3** |
| Alkalinity | 0/10 | 0/13 | NA/**Exceeded by 3** |
| Chloride | 0/10 | 0/13 | NA/**Exceeded by 3** |
| Specific Conductance | 0/10 | 0/13 | NA/**Exceeded by 3** |
| Total Dissolved Solids | 0/10 | 0/13 | NA/**Exceeded by 3** |
| Hardness | 0/10 | 0/13 | NA/**Exceeded by 3** |
| Nitrate | 0/10 | 0/13 | NA/**Exceeded by 3** |
| Sulfate | 0/10 | 0/13 | NA/**Exceeded by 3** |
| Non-methane organic compounds (NMOC) | 0/0 | 0/0 | NA |
| Biogenic/fixed gases: Oxygen, carbon dioxide, methane, carbon monoxide, nitrogen | 0/0 | 0/0 | NA |
| Sulfur gases: Hydrogen sulfide, carbonyl sulfide, carbon disulfide, mercaptans | 0/0 | 0/0 | NA |
| Total organic compounds (TOC) | 0/0 | 0/0 | NA |

**Notes:**
Analysis perfomed on soil and groundwater samples collected from direct-push borings.
NA = Not applicable

**Table 5.22.1C**
**Drive Point Groundwater Sample Analytical Objective Analysis**
**Mission Bay Landfill**
**San Diego, California**

| Analytes | Proposed Analysis | Completed Analysis | Met or Exceeded Analysis Objective |
|---|---|---|---|
| VOCs | 4 | 4 | **Met** |
| Semi-volatile organic compounds (SVOCs) | 4 | 4 | **Met** |
| Polychlorinated biphenyls (PCBs) | 0 | 0 | NA |
| Pesticides | 0 | 0 | NA |
| Chlorinated Herbicides | 0 | 0 | NA |
| Polynuclear aromatic hydrocarbons (PAHs) | 0 | 0 | NA |
| Title 22 Metals | 0 | 0 | NA |
| Ultra-low detection sampling and analysis for 17 metals | 4 | 4 | **Met** |
| Cyanide | 0 | 0 | NA |
| Fluoride | 4 | 4 | **Met** |
| pH | 4 | 4 | **Met** |
| Alkalinity | 4 | 4 | **Met** |
| Chloride | 4 | 4 | **Met** |
| Specific Conductance | 4 | 4 | **Met** |
| Total Dissolved Solids | 4 | 4 | **Met** |
| Hardness | 4 | 4 | **Met** |
| Nitrate | 4 | 4 | **Met** |
| Sulfate | 4 | 4 | **Met** |
| Non-methane organic compounds (NMOC) | 0 | 0 | NA |
| Biogenic/fixed gases: Oxygen, carbon dioxide, methane, carbon monoxide, nitrogen | 0 | 0 | NA |
| Sulfur gases: Hydrogen sulfide, carbonyl sulfide, carbon disulfide, mercaptans | 0 | 0 | NA |
| Total organic compounds (TOC) | 0 | 0 | NA |

**Notes:**
Analysis performed on groundwater samples collected from drive points.
NA = Not applicable

**Table 5.22.1D**
**Monitoring Well Groundwater Sample Analytical Objective Analysis**
**Mission Bay Landfill**
**San Diego, California**

| Analytes | Proposed Analysis | Completed Analysis | Met or Exceeded Analysis Objective |
|---|---|---|---|
| VOCs | 11 | 11 | **Met** |
| Semi-volatile organic compounds (SVOCs) | 11 | 11 | **Met** |
| Polychlorinated biphenyls (PCBs) | 0 | 0 | NA |
| Pesticides | 0 | 0 | NA |
| Chlorinated Herbicides | 0 | 0 | NA |
| Polynuclear aromatic hydrocarbons (PAHs) | 0 | 0 | NA |
| Title 22 Metals | 0 | 0 | NA |
| Ultra-low detection sampling and analysis for 17 metals | 11 | 11 | **Met** |
| Cyanide | 0 | 0 | NA |
| Fluoride | 11 | 11 | **Met** |
| pH | 11 | 11 | **Met** |
| Alkalinity | 11 | 11 | **Met** |
| Chloride | 11 | 11 | **Met** |
| Specific Conductance | 11 | 11 | **Met** |
| Total Dissolved Solids | 11 | 11 | **Met** |
| Hardness | 11 | 11 | **Met** |
| Nitrate | 11 | 11 | **Met** |
| Sulfate | 11 | 11 | **Met** |
| Non-methane organic compounds (NMOC) | 0 | 0 | NA |
| Biogenic/fixed gases: Oxygen, carbon dioxide, methane, carbon monoxide, nitrogen | 0 | 0 | NA |
| Sulfur gases: Hydrogen sulfide, carbonyl sulfide, carbon disulfide, mercaptans | 0 | 0 | NA |
| Total organic compounds (TOC) | 0 | 0 | NA |

**Notes:**
Analysis performed on groundwater samples collected from monitoring wells.
NA = Not applicable

**Table 5.22.1E**
**Sediment Sample Analytical Objective Analysis**
**Mission Bay Landfill**
**San Diego, California**

| Analytes | Proposed Analysis | Completed Analysis | Met or Exceeded Analysis Objective |
|---|---|---|---|
| VOCs | 5 | 5 | **Met** |
| Semi-volatile organic compounds (SVOCs) | 5 | 5 | **Met** |
| Polychlorinated biphenyls (PCBs) | 5 | 5 | **Met** |
| Pesticides | 5 | 5 | **Met** |
| Chlorinated Herbicides | 5 | 5 | **Met** |
| Polynuclear aromatic hydrocarbons (PAHs) | 5 | 5 | **Met** |
| Title 22 Metals | 5 | 5 | **Met** |
| Ultra-low detection sampling and analysis for 17 metals | 0 | 0 | NA |
| Cyanide | 5 | 5 | **Met** |
| Fluoride | 0 | 0 | NA |
| pH | 0 | 0 | NA |
| Alkalinity | 0 | 0 | NA |
| Chloride | 0 | 0 | NA |
| Specific Conductance | 0 | 0 | NA |
| Total Dissolved Solids | 0 | 0 | NA |
| Hardness | 0 | 0 | NA |
| Nitrate | 0 | 0 | NA |
| Sulfate | 0 | 0 | NA |
| Non-methane organic compounds (NMOC) | 0 | 0 | NA |
| Biogenic/fixed gases: Oxygen, carbon dioxide, methane, carbon monoxide, nitrogen | 0 | 0 | NA |
| Sulfur gases: Hydrogen sulfide, carbonyl sulfide, carbon disulfide, mercaptans | 0 | 0 | NA |
| Total organic compounds (TOC) | 0 | 0 | NA |

**Notes:**
Analysis performed on sediment samples.
NA = Not applicable

**Table 5.22.1F**
**Surface Soil Sample Analytical Objective Analysis**
**Mission Bay Landfill**
**San Diego, California**

| Analytes | Proposed Analysis | Completed Analysis | Met or Exceeded Analysis Objective |
|---|---|---|---|
| VOCs | 10 | 10 | **Met** |
| Semi-volatile organic compounds (SVOCs) | 10 | 10 | **Met** |
| Polychlorinated biphenyls (PCBs) | 10 | 10 | **Met** |
| Pesticides | 10 | 10 | **Met** |
| Chlorinated Herbicides | 10 | 10 | **Met** |
| Polynuclear aromatic hydrocarbons (PAHs) | 10 | 10 | **Met** |
| Title 22 Metals | 10 | 10 | **Met** |
| Ultra-low detection sampling and analysis for 17 metals | 0 | 0 | NA |
| Cyanide | 10 | 10 | **Met** |
| Fluoride | 0 | 0 | NA |
| pH | 0 | 0 | NA |
| Alkalinity | 0 | 0 | NA |
| Chloride | 0 | 0 | NA |
| Specific Conductance | 0 | 0 | NA |
| Total Dissolved Solids | 0 | 0 | NA |
| Hardness | 0 | 0 | NA |
| Nitrate | 0 | 0 | NA |
| Sulfate | 0 | 0 | NA |
| Non-methane organic compounds (NMOC) | 0 | 0 | NA |
| Biogenic/fixed gases: Oxygen, carbon dioxide, methane, carbon monoxide, nitrogen | 0 | 0 | NA |
| Sulfur gases: Hydrogen sulfide, carbonyl sulfide, carbon disulfide, mercaptans | 0 | 0 | NA |
| Total organic compounds (TOC) | 0 | 0 | NA |

**Notes:**
Analysis performed on surface soil samples.
NA = Not applicable

**Table 5.22.1G**
**Landfill Gas & Soil Vapor Sample Analytical Objective Analysis**
**Mission Bay Landfill**
**San Diego, California**

| Analytes | Proposed Analysis (landfill gas/soil vapor) | Completed Analysis (landfill gas/soil vapor) | Met or Exceeded Analysis Objective (landfill gas/soil vapor) |
|---|---|---|---|
| VOCs | 0/10 | 0/10 | NA/**Met** |
| Semi-volatile organic compounds (SVOCs) | 0/0 | 0/0 | NA |
| Polychlorinated biphenyls (PCBs) | 0/0 | 0/0 | NA |
| Pesticides | 0/0 | 0/0 | NA |
| Chlorinated Herbicides | 0/0 | 0/0 | NA |
| Polynuclear aromatic hydrocarbons (PAHs) | 0/0 | 0/0 | NA |
| Title 22 Metals | 0/0 | 0/0 | NA |
| Ultra-low detection sampling and analysis for 17 metals | 0/0 | 0/0 | NA |
| Cyanide | 0/0 | 0/0 | NA |
| Fluoride | 0/0 | 0/0 | NA |
| pH | 0/0 | 0/0 | NA |
| Alkalinity | 0/0 | 0/0 | NA |
| Chloride | 0/0 | 0/0 | NA |
| Specific Conductance | 0/0 | 0/0 | NA |
| Total Dissolved Solids | 0/0 | 0/0 | NA |
| Hardness | 0/0 | 0/0 | NA |
| Nitrate | 0/0 | 0/0 | NA |
| Sulfate | 0/0 | 0/0 | NA |
| Non-methane organic compounds (NMOC) | 0/10 | 0/10 | NA/**Met** |
| Biogenic/fixed gases: Oxygen, carbon dioxide, methane, carbon monoxide, nitrogen | 0/10 | 0/10 | NA/**Met** |
| Sulfur gases: Hydrogen sulfide, carbonyl sulfide, carbon disulfide, mercaptans | 0/10 | 0/10 | NA/**Met** |
| Total organic compounds (TOC) | 50/10 | 50/10 | **Met/Met** |

**Notes:**
Analysis performed on landfill gas & soil vapor samples.
NA = Not applicable

**Table 5.22.2**
**Reported Detection Data Quality Analysis**
**Mission Bay Landfill, San Diego, California**

**Analytes in Soil and Sediment**

| | Commercial/Industrial CHHSL (mg/kg) | Detection Limit (mg/kg) | Analysis Methodology |
|---|---|---|---|
| Antimony | 380.0 | 0.50 | EPA Method 6010B/7470A |
| Arsenic | 0.24 | 0.10 | EPA Method 6010B/7470A |
| Barium | 63,000.0 | 0.5 | EPA Method 6010B/7470A |
| Beryllium | 1,700.0 | 0.50 | EPA Method 6010B/7470A |
| Cadmium | 7.5 | 0.50 | EPA Method 6010B/7470A |
| Chromium | 100,000.0 | 0.50 | EPA Method 6010B/7470A |
| Cobalt | 3,200.0 | 0.50 | EPA Method 6010B/7470A |
| Copper | 38,000.0 | 0.50 | EPA Method 6010B/7470A |
| Lead | 3,500.0 | 0.25 | EPA Method 6010B/7470A |
| Mercury | 180.0 | 0.20 | EPA Method 6010B/7470A |
| Molybdenum | 4,800.0 | 0.50 | EPA Method 6010B/7470A |
| Nickel | 16,000.0 | 0.50 | EPA Method 6010B/7470A |
| Selenium | 4,800.0 | 0.50 | EPA Method 6010B/7470A |
| Silver | 4,800.0 | 0.50 | EPA Method 6010B/7470A |
| Thallium | 63.0 | 0.50 | EPA Method 6010B/7470A |
| Vanadium | 6,700.0 | 0.50 | EPA Method 6010B/7470A |
| Zinc | 100,000.0 | 0.50 | EPA Method 6010B/7470A |
| Hexavalent Chromium | 37.0 | 0.10 | EPA Method 7199 |
| Acetone | NS | 5 | EPA Method 8260 |
| Benzo(b)fluoranthene | NS | 2 | EPA Method 8310 |
| Chrysene | NS | 5 | EPA Method 8310 |
| Acenapthene | NS | 100 | EPA Method 8310 |
| Anthracene | NS | 2 | EPA Method 8310 |
| Naphthalene | NS | 50 | EPA Method 8310 |
| Fluoranthene | NS | 5 | EPA Method 8310 |
| Phenanthrene | NS | 4 | EPA Method 8310 |
| Pyrene | NS | 10 | EPA Method 8310 |

**Analytes in Groundwater**

| | Drinking water PHG (µg/L) | Ocean Plan (µg/L) | Drinking water PRG (µg/L) | Detection Limit (µg/L) | Analysis Methodology |
|---|---|---|---|---|---|
| Diethyl ether | NS | NS | NS | 0.33 | EPA Method 8260 |
| 1,2-Dichloropropane | 0.50 | NS | **0.165** | 1.00 | EPA Method 8260 |
| Vinyl chloride | 0.05 | 36.0 | **0.0198** | 3.00 | EPA Method 8260 |
| Methylene chloride | NS | NS | **4.276** | 5.00 | EPA Method 8260 |
| Benzene | **0.15** | 5.9 | 0.35 | **1.00** | EPA Method 8260 |
| Chlorobenzene | 200.0 | 570.0 | **106.07** | 1.00 | EPA Method 8260 |
| Ethylbenzene | **300.0** | 4,100.0 | 1,339.87 | 1.00 | EPA Method 8260 |
| 1,4-Dichlorobenzene | 6.0 | 18.0 | **0.50** | **1.00** | EPA Method 8260 |
| Isopropylbenzene | NS | NS | **658.20** | 1.00 | EPA Method 8260 |
| Naphthalene | NS | NS | NS | 1.00 | EPA Method 8260 |
| 1,2,4-Trimethylbenzene | NS | NS | **12.33** | 1.00 | EPA Method 8260 |
| Total Xylenes | 1,800.0 | NS | **205.73** | 3.00 | EPA Method 8260 |
| cis-1,2-Dichloroethene | NS | NS | **60.83** | 1.00 | EPA Method 8260 |
| Methyl Tertiary Butyl Ether | 13.0 | NS | **11** | 2.00 | EPA Method 8260 |
| Bis(2-ethylhexyl) phthalate | NS | 3.50 | 4.80 | **10.00** | EPA Method 8270C |
| Pentachlorophenol | **0.4** | NS | 0.56 | **1.00** | EPA Method 8270C |
| Hexavalent Chromium | NS | **2.0** | 109.50 | 1.0 & **5.0** | EPA Method 7199 |
| Beryllium | **1.0** | NS | 73.0 | 0.001 | EPA Method 1669/1640 |
| Vanadium | NS | NS | **36.0** | 0.850 | EPA Method 1669/1640 |
| Chromium | NS | 190000 | **54747** | 0.026 | EPA Method 1669/1640 |
| Cobalt | NS | NS | **730.0** | 0.070 | EPA Method 1669/1640 |
| Nickel | 12.0 | **5.0** | 730.0 | 0.026 | EPA Method 1669/1640 |
| Copper | 170.0 | **3.0** | 1,500 | 0.024 | EPA Method 1669/1640 |
| Zinc | NS | **20.0** | 11,000 | 0.066 | EPA Method 1669/1640 |
| Arsenic | **0.0040** | 8.0 | 0.045 | **0.016** | EPA Method 1669/1640 |
| Selenium | NS | **15.0** | 180.0 | 0.057 | EPA Method 1669/1640 |
| Molybdenum | NS | NS | **180.0** | 0.145 | EPA Method 1669/1640 |
| Silver | NS | **0.7** | 180.0 | 0.020 | EPA Method 1669/1640 |
| Cadmium | **0.070** | 1.0 | 18.0 | 0.006 | EPA Method 1669/1640 |
| Antimony | 20.0 | NS | **15.0** | 0.073 | EPA Method 1669/1640 |
| Barium | **2000** | NS | 2600 | 0.018 | EPA Method 1669/1640 |
| Thallium | **0.10** | NS | 2.4 | 0.002 | EPA Method 1669/1640 |
| Lead | **2.0** | **2.0** | NS | 0.009 | EPA Method 1669/1640 |
| Mercury | 1.2 | **0.04** | 11.0 | 0.00012 | EPA Method 1631 |

**Table 5.22.3**
**Laboratory Report Quality Assurance and Quality Control Analysis**
**Mission Bay Landfill**
**San Diego, California**

| Sample Type(s) | Laboratory | Laboratory Job Number | Laboratory Comments | LCS Performed | LCS Analyis Confirms Laboratory Comment |
|---|---|---|---|---|---|
| Soil boring soil & groundwater | ASL | 22371 | Low surrogate recovery due to matrix effects | Yes | Yes |
| Soil boring soil & groundwater | ASL | 22408 | Low surrogate recovery due to matrix effects | Yes | Yes |
| Soil boring soil & groundwater | ASL | 22866 | Low surrogate recovery due to matrix effects | Yes | LCS recovery % slightly low for a portion of surrogate analytes |
| Soil boring soil & groundwater | ASL | 22871 | Groundwater sample B15-GW: Low surrogate recovery due to matrix effects | Yes | LCS recovery % slightly low for a portion of surrogate analytes |
| Soil boring soil & groundwater | ASL | 23518 | Groundwater sample B18-GW: Low surrogate recovery due to matrix effects | Yes | Yes |
| Monitoring well soil | ASL | 23193 | Soil sample SCS3-10': Higher Practical Quantitation Limit due to matrix effects | Yes | Yes |
| Monitoring well soil | ASL | 23193 | Soil sample SCS3-5': Higher Practical Quantitation Limit due to matrix effects | Yes | Yes |
| Monitoring well groundwater | ASL | 23889 | High Practical Quantitation Limits and low surrogate recovery due to matrix effects | Yes | Yes |
| Drive point groundwater | ASL | 24070 | Drive point sample DP 3: Low surrogate due to matrix effects | Yes | Yes |
| Monitoring well & drive point groundwater | Battelle | | The blank metal concentration for Thallium was greater than 10X the MDL. All sample results were less than 5X the blank concentration which indicate that the results may be impacted. Contamination is registering in the method blank possibly due to laboratory contamination. | | |

**Table 5.22.4**
**Field Quality Assurance and Quality Control Analysis**
**Mission Bay Landfill**
**San Diego, California**

| Sample Type(s) | Laboratory | Comments |
|---|---|---|
| Monitoring well groundwater (Ultra Low Detection metals | Battelle | Field and Trip blanks were reported to contain zinc concentrations above the detection limits. The reported zinc concentration in the field blank (4.28 µg/L) is considerably higher than the reported zinc conentration in the trip blank (0.110 µg/L) which suggests field contamination. |

| Laboratory | CA ELAP Number | EPA & NELAP Number |
|---|---|---|
| H&P Mobile Geochemistry | 2278 | N/A |
| American Scientific Laboratories | 2200 | N/A |
| Battelle | N/A | WA004 |
| Severn Trent | 2092 | N/A |